CLAIMS

1. A magnetic random access memory comprising:

a plurality of magnetoresistance elements having magnetic anisotropy directed in a first direction;

a wiring provided to extend in a second direction different from said first direction; and

a yoke layer formed of ferromagnetic material, extended in said second direction, and covering at least portion of a surface of said wiring;

wherein said plurality of magnetoresistance elements include:

a first magnetoresistance element;

a second magnetoresistance element whose distance from an end of said yoke layer in the second direction is larger than that of said first magnetoresistance element,

wherein said magnetic anisotropy of said first magnetoresistance element is stronger than said magnetic anisotropy of said second magnetoresistance element.

2. The magnetic random access memory according to claim 1, wherein a first aspect ratio defined as a ratio of a length of said first magnetoresistance element in said first direction to a width of said first magnetoresistance element in said second

direction is larger than a second aspect ratio defined as a ratio of a length of said second magnetoresistance element in said first direction to a width of said second magnetoresistance element in said second direction.

3. A magnetic random access memory comprising:

a magnetoresistance element;

a first wiring through which a write current is flown for writing data into said magnetoresistance element;

a first yoke layer formed of ferromagnetic material, extended in said first direction, and covering at least portion of a surface of said wiring;

a magnetic field control structure introducing a magnetic field developed by magnetic poles appearing at ends of said first yoke layer in said first direction away from said magnetoresistance element.

4. The magnetic random access memory according to claim 3, wherein said magnetic field control structure includes a magnetic shielding structure positioned between said ends of said first yoke layer and said magnetoresistance element.

5. The magnetic random access memory according

to claim 4, wherein said magnetic shielding structure obliquely intersects said first wiring.

6. The magnetic random access memory according to claim 5, wherein said magnetic shielding structure has a same stack structure as at least a portion of said magnetoresistance element.

7. The magnetic random access memory according to claim 4, further comprising:

a second wiring which is not used for writing data into any magnetoresistance elements within said magnetic random access memory, said second wiring being provided to extend in a direction different from said first direction and positioned between said end of said yoke layer and said magnetoresistance element; and

a second yoke layer covering at least a portion of a surface of said second wiring,

wherein said second yoke layer functions as said magnetic shielding structure.

8. The magnetic random access memory according to claim 3, further comprising:

a spacer layer covering said first yoke layer,

wherein said magnetic field control structure

includes a magnetic layer covering said spacer layer, and

wherein said magnetic layer introduces a magnetic field emitted from one of said ends of said first yoke layer into another of said ends of said first yoke layer.

9. The magnetic random access memory according to claim 8, wherein magnetizations of said first yoke layer and said magnetic layer are directed in opposite directions.

10. The magnetic random access memory according to claim 9, wherein said spacer layer is formed so as to provide antiferromagnetic coupling between said first yoke layer and said magnetic layer.

11. The magnetic random access memory according to claim 3, further comprising:

a second interconnection provided to extend in said first direction; and

a second yoke layer formed of ferromagnetic material, extended in said first direction, and covering at least portion of a surface of said second wiring,

wherein said magnetic field control structure includes a magnetic member magnetically connecting

said first and second yoke layers.

12. The magnetic random access memory according to claim 11, wherein said second wiring is adjacent to said first wiring in a second direction orthogonal to said first direction, and

wherein said magnetic member includes:

a first magnetic member magnetically connecting one end of said first yoke layer with one end of said second yoke layer; and

a second magnetic member magnetically connecting another end of said first yoke layer with another end of said second yoke layer.

13. The magnetic random access memory according to claim 12, further comprising:

a third magnetic member disposed between said first and second magnetic members;

a fourth magnetic member positioned on an opposite side of said magnetoresistance element with respect to said third magnetic member, disposed between said first and second magnetic members.

14. The magnetic random access memory according to claim 11, wherein said second wiring is adjacent to said first wiring in said first direction.

15. The magnetic random access memory according to claim 3, further comprising:

a second wiring provided to extend in said first direction, and adjoining said first wiring in said first direction; and

a second yoke layer formed of ferromagnetic material, extended in said first direction, and covering at least portion of a surface of said second wiring,

wherein said second yoke layer functions as said magnetic field control structure, arranged close to said first yoke layer so that said second yoke layer is magnetically connected with said first yoke layer.

16. A magnetic random access memory comprising:

a magnetoresistance element;

a wiring through which a write current is flown for writing data into said magnetoresistance element; and

a yoke layer formed of ferromagnetic material, extended in a direction in which said wiring is extended, and covering at least portion of a surface of said second wiring,

wherein an end of said yoke layer is positioned sufficiently far away so that a magnetic field emitted from said end exerts substantially no

effect on characteristics of said magnetoresistance element.

17. A magnetic random access memory comprising:

magnetoresistance elements arranged in rows and columns;

a wiring through which a write current is flown for writing data into said magnetoresistance elements; and

a yoke layer formed of ferromagnetic material, extended in a direction in which said wiring is extended, and covering at least portion of a surface of said second wiring,

wherein an end of said yoke layer is positioned away from a nearest magnetoresistance element so that an intensity of a magnetic field which a magnetic pole appears at said end applies to said nearest magnetoresistance element is reduced down to or less of one-fifth of an intrinsic coercive field of free ferromagnetic layers within said magnetoresistance elements, said nearest magnetoresistance element being one of said magnetoresistance elements closest to said end.

18. A magnetic random access memory comprising:

a plurality of first wirings extending in a first direction;

a plurality of second wirings disposed to extend in a second direction different from said first direction;

first yoke layers covering at least portions of said respective first wirings; and

magnetoresistance elements arranged at respective intersections of said first and second wirings,

wherein first ends of said first yoke layers in said first direction are positioned away from nearest magnetoresistance elements so that distances from said nearest magnetoresistance elements to said first ends are equal to or more than a minimum pitch of said second wirings, said nearest magnetoresistance elements being ones of said magnetoresistance elements positioned nearest to said first ends.